Scratchbuild A Backwoods Water Tank
Part VI - Making the Ladder, the Water Gauge and Its Rollers, the Water Valve, and the Top Hatch

By Dwight Ennis

We're now into the home stretch now! This is the last part of this article, and in it we'll finish things up with a few remaining detail parts.

Download the Drawings

The following drawings are for this section:

- **Drawing Seventeen - Ladder**
- **Drawing Eighteen - Water Gauge Parts**
- **Drawing Nineteen - Water Gauge Assembly**
- **Drawing Twenty - Water Valve and Hatch**

After downloading the drawings, print one or more copies.

Making the Ladder

The **ladder** is made from 2 x 4 (0.10 x 0.20) lumber. The two long stringers are 22.5' (13.50) long, while the twenty rungs are each 20" (1.00) long. Start by cutting the pieces to length. Lay your scale along one stringer and, starting at one end (which will become the bottom) , make a mark every scale foot (0.60) for the twenty rungs. Then lay this stringer against the second one and transfer the marks to it as well. The marks are the top edges of each rung.

Lay the two stringers on a flat surface, marked side up, with their outer edges a scale 18" (0.90) apart and glue a rung at the top and bottom locations, then lay a piece of scrap on top and clamp, then allow to dry. The edges

of each rung will extend a scale inch (0.50) beyond the outside edge of each stringer. Also, remember, the top rung is 1.50" from the top ends of the stringers.

Glue two more rungs in place roughly equidistant between the top and bottom rungs, clamp and allow to dry.

The four rungs act to maintain the ladder's shape. Go ahead now and glue on the remaining rungs, then clamp the whole assembly and allow to dry. Once everything sets up, emboss nail heads on the rungs, two per rung per side.

The **ladder** is now complete. We'll mount it later.

Making the Water Gauge

Refer to **Drawing Eighteen** for the piece parts of the **Water Gauge**. Basically, it consists of two side channels, the scale, and the indicator. The side channels are fabricated from **Evergreen Scale Models** styrene, as is the **Indicator** (you'll need to glue two pieces together to get the proper thickness for the Indicator). The scale is made of a piece of basswood.

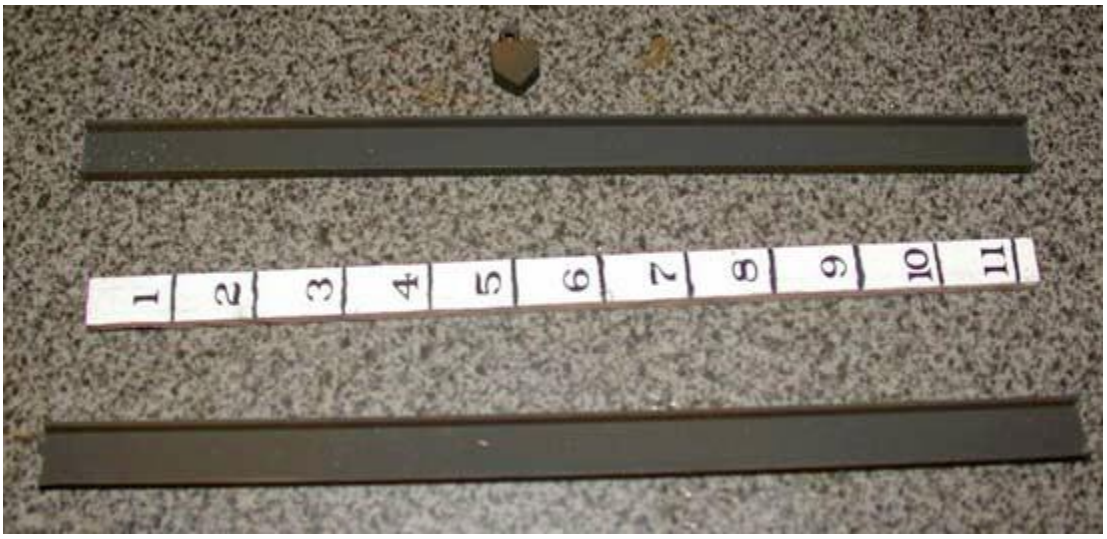
None of these materials is particularly critical. You can really use whatever will work. When I was ready to make mine, I knew what I had in mind, then went to the hobby shop and looked over the styrene in stock. I simply picked out what looked right. Part of scratchbuilding is being able to visualize what you need, then find appropriate materials to make it from.

You'll notice in the photo below that my side channels don't have the two holes in each end. This is because I added them afterward. Once I had the gauge assembled, I realized that it would look better (to my eye) if there was a visible means of holding it together. Consequently, I added the NBW's and short sections of 0.030 diameter brass wire shown in **Drawing Nineteen**.

The scale was painted white. I then hand-painted the scale lines in black so I'd have a more rustic look. My hand isn't steady enough to paint the numbers as well, so I used some dry transfers I had laying around. You could certainly hand paint yours, or you can cut out the scale from the drawing and laminate it to a piece of wood.

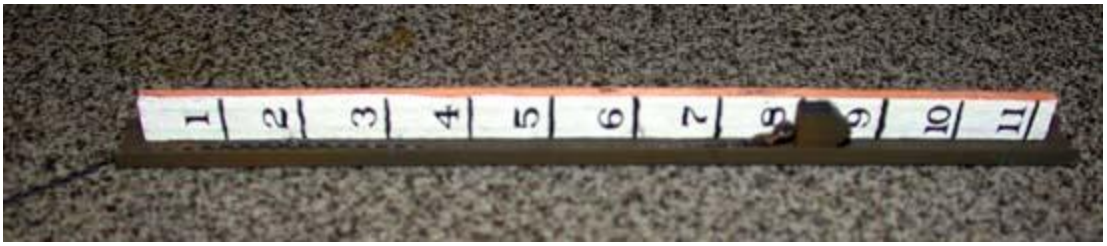
The eyelet in the top of the indicator is from **Micro-Mark** (#60405). These are similar, if not identical, to the ones supplied in some **Hartford Products** kits. After losing several while assembling his kits, I laid a supply. You could just as easily make one from brass wire.

The side channels and indicator are painted Grimy Black, with a dusting of Rust.

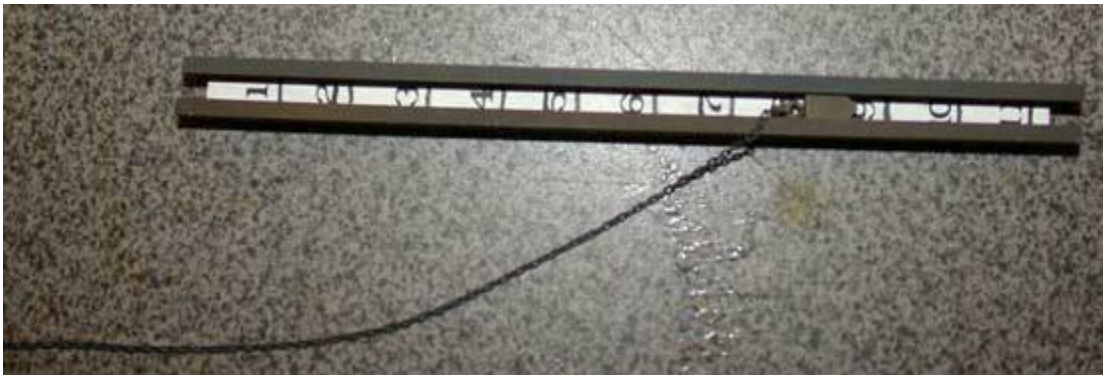


The scale is glued to one side channel, with it's back edge pressed against the inside of the channel flange, and centered lengthwise. The indicator is then glued to the scale. Affix a length of pre-blackened chain to the eyelet before attaching the indicator.

Where you put the indicator depends on how full you want your tank to be. The lower it is, the fuller the tank is. On the real ones, the chain attached to the indicator was attached to a float inside the tank. As the tank got fuller, the float would rise, lowering the indicator on the scale.



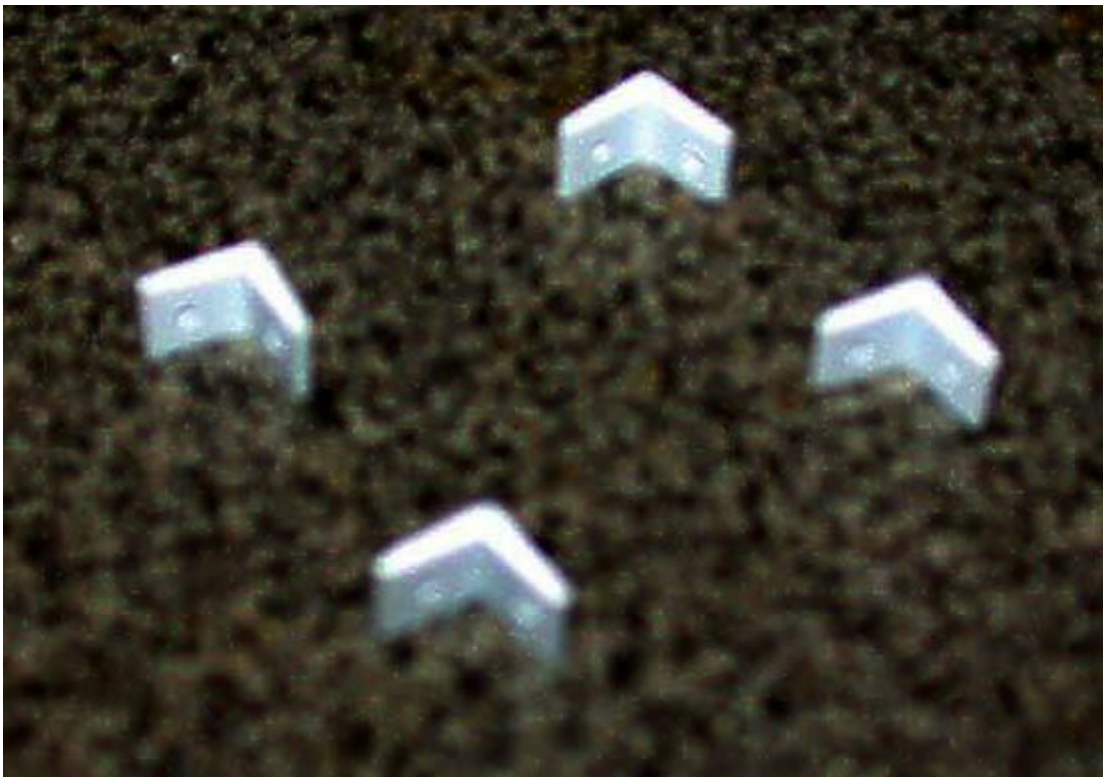
Glue on the other side channel. At this point, I slid the 0.030 wire through the holes and glued on the NBW castings. These were smaller castings I had left over from a **Hartford** kit. Any small NBW castings will do.



Cut a piece of wood 0.10 x 0.10 x 4.80 to make the backing board, and glue it to the rear of the scale between the channel flanges. This completes the **Water Gauge**.

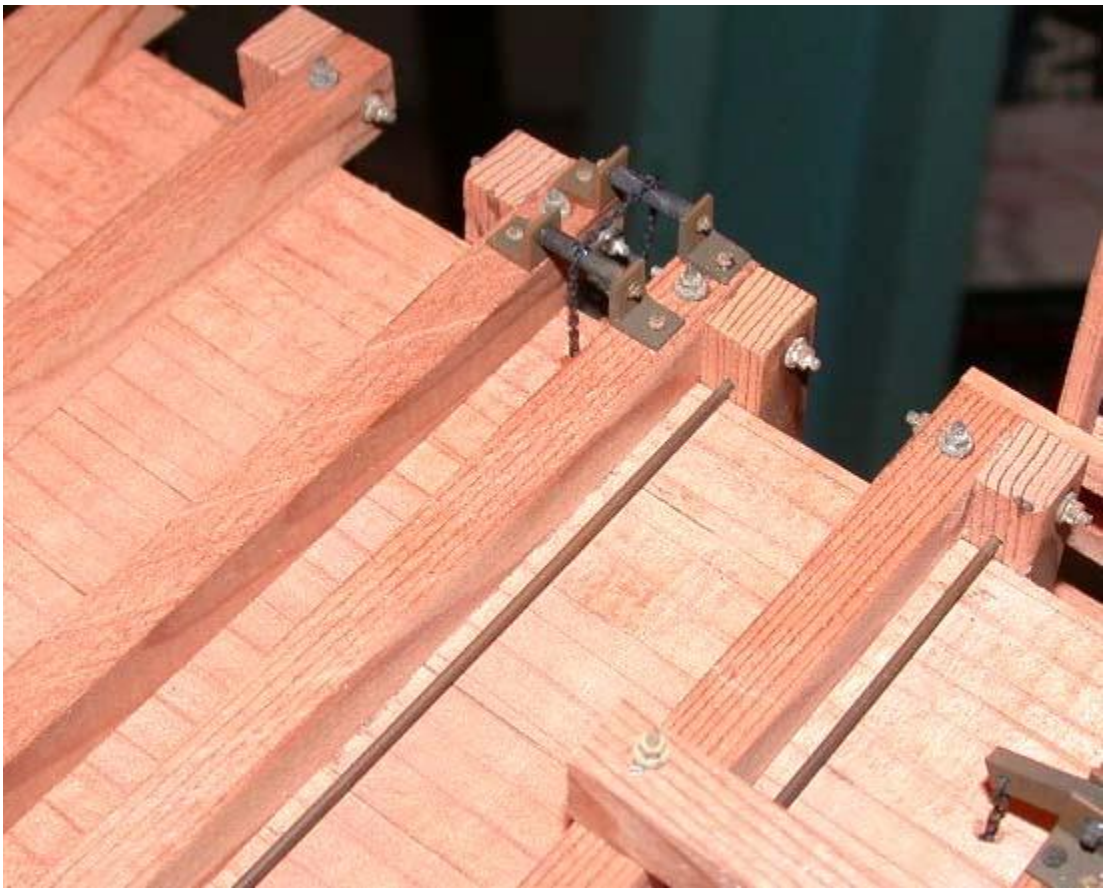
Making the Water Gauge Rollers

These **rollers** guide the **Water Gauge Indicator** chain at the top of the tank, and allow the chain to easily slide up and down. I thought of using small pulleys here, but couldn't find any that I liked. The support brackets for the Water Gauge Rollers are made from 1/4" x 1/4" Styrene Angle. Refer to **Drawing Eighteen** for dimensions. Again, these are painted Grimy Black with a dusting of Rust. The rollers themselves are a piece of 1/16" diameter brass rod, cut 0.40" long. This allows the brackets to fit the **Tank Supports**. Paint or blacken the brass rods.



(Apologies for the poor quality of this photo)

Here's the completed rollers. The NBW's I used here were the same ones I used on the gauge itself. Here you can see the 0.030 wire "bolts" extending between the channels. Glue the gauge to the tank centered on one side (which side is entirely up to you... it depends on which side will be more visible on your layout). Drill a 1/16" or so hole in the tank top where the chain enters the tank, and glue the chain into the hole.

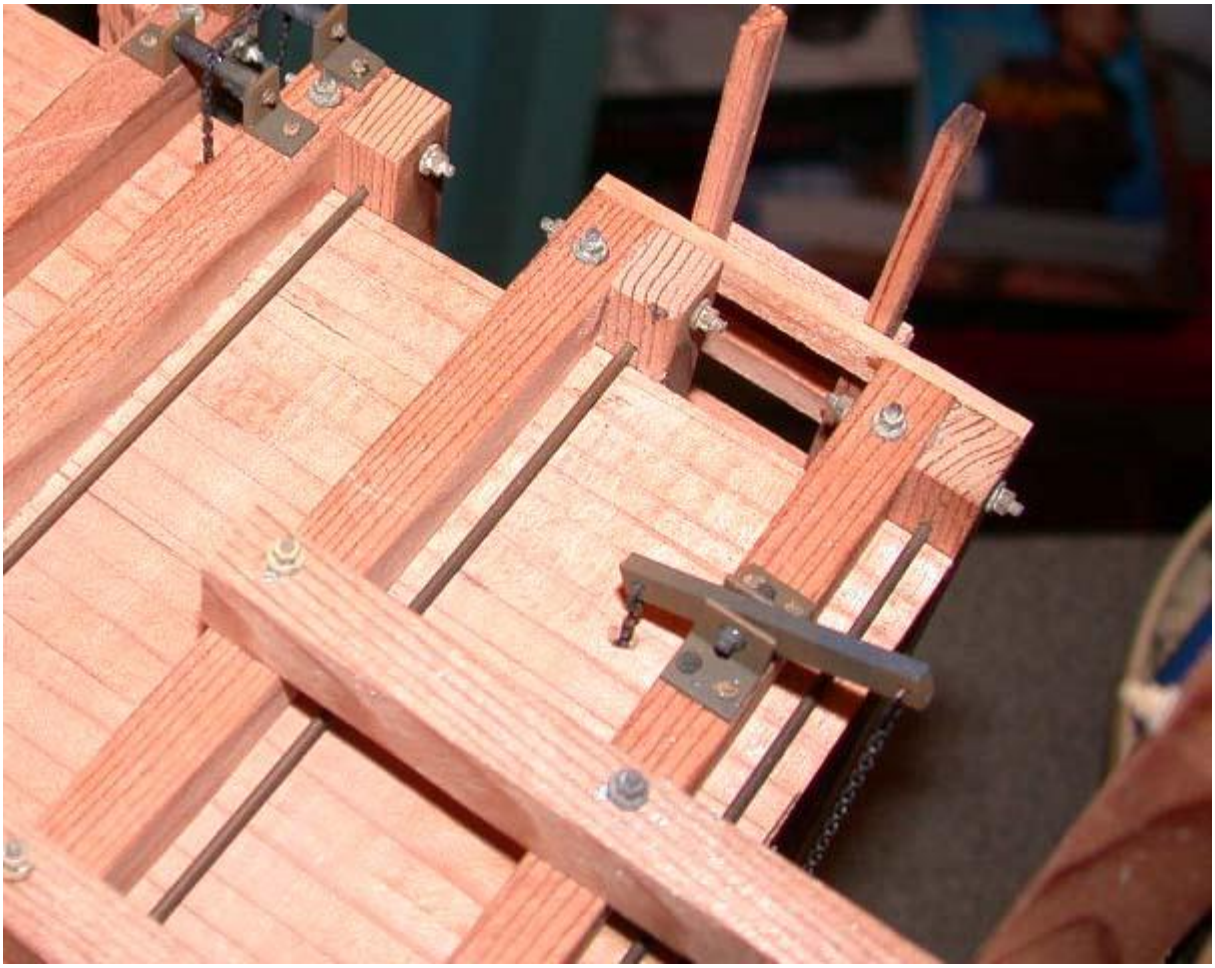


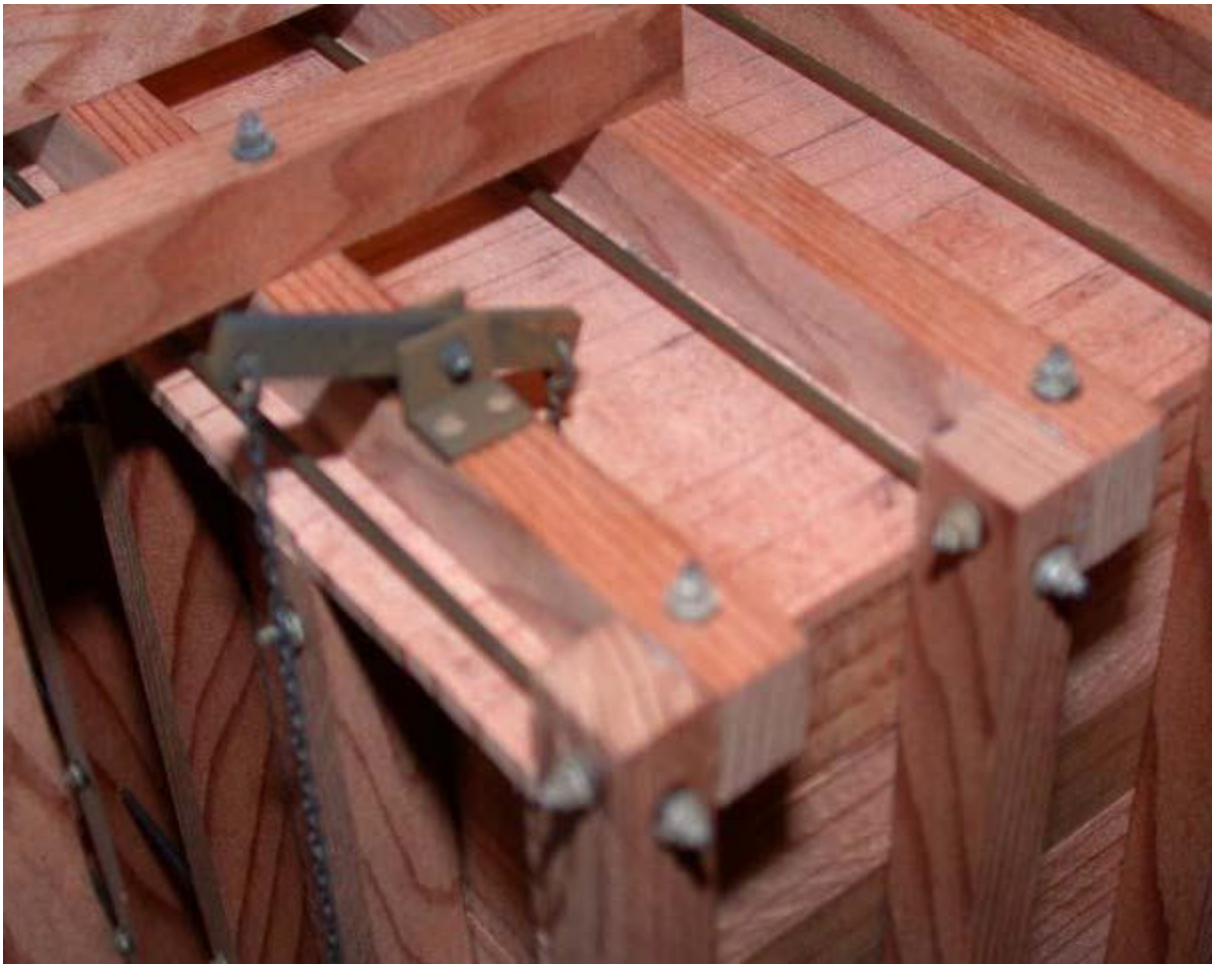
The Water Valve

The **Water Valve** is a simple lever with a ling chain that allowed the engine crew to open and close the water valve. Pull the chain and water flows. Let go and it stops.

The brackets are made from the same 1/4 x 1/4 Styrene Angle previously used to make the roller brackets. The only difference is that they're a little longer and have two holes on the bottom side instead of one. Refer to **Drawing Twenty** for dimensions.

The lever is made from 0.080 x 0.156 Styrene. Again, refer to **Drawing Twenty** for dimensions. Assemble as shown in the photo below, paint with Grimy Black and Rust, add a length of chain to each end and mount it to the tank with the long end sticking out the front. Drill a hole in the tank for the chain on the short end to enter the tank (just like the water gauge chain). The chain from the long end should hang down far enough to allow it to be reached by the engine crew while standing on the locomotive tender.





Making the Hatch

The **hatch** in the top provides access to the inside of the tank for service. Consequently, it should be mounted near a tank wall to allow for a ladder down inside the tank. The hatch itself is simple, being nothing more than a hinged cover over a frame of 2 x 4's (0.10 x 0.20). Again, refer to **Drawing Twenty** for dimensions. The **Materials List** in **Part I** will provide the lumber sizes used. The hinges are the same ones used on the Frost Box Door with the long end cut down, and are attached the same way. The handle is the same O-Scale Grabiron used on the Frost Box Door as well (it came as a set of two). Don't forget to emboss the nail heads on the Hatch Cover Braces.

Attaching the Ladder

Decide where you want your ladder attached and glue a couple of lengths of 2 x 4 (0.10 x 0.20) to the **Tank Supports**, one at the top and one at the bottom. Emboss nail heads and glue the ladder to these 2 x 4's. Note that the ladder stringers are "toe-nailed" at the sides into the 2 x 4's. The bottom of the left stringer on mine glues to the bottom sill of the front bent. Depending upon where you decide to mount your ladder, your mileage may vary.

The figure on my ladder is from **Just Plain Folk** which I picked up at last year's **Queen Mary Show**.

A Quick Word About Weathering

As you've undoubtedly noticed by now, no attempt has been made to weather the wood. This was a deliberate choice on my part. Redwood will weather quite a bit in a single year when out of doors. The **Sanding Facility** I built last fall weathered substantially after a single winter. The **Sanding Facility** is visible in the finished photos at the end of this article, just to the right of the **Water Tank**. When it was installed, its finish was very much the same as the tank's. For that reason, I chose to let the wood weather naturally.

Mounting in the Garden

If you live in an area with occasional high winds, you may want to consider some method of holding the tank upright and in place. It's a top-heavy model, and the flat surfaces of the tank proper will offer resistance to the wind. As I write this, we had wind gusts up to 30 or 40 mph last night, and this morning the tank was laying on

its side. Nothing at all was broken - either a testament to how sturdily it was constructed or (more likely) sheer luck!

Drilling four 1/8" holes in the bottom and inserting some 1/8" diameter brass rods that will push into the ground and hold the tank upright is one solution. Screwing the foundation beams (from the underside) to a piece of pressure treated plywood or other material that will sit in the ground abd be covered by dirt is another.

Conclusion

Your **Backwoods Water Tank** is now finished and ready to start quenching the never-ending thirst of those iron horses. Thanks to your perseverance, you now have a totally unique structure for your garden railroad. Even if you followed the plans and instructions of this article to the letter, it's highly doubtful that your tank is exactly like mine or anyone else's. So sit back, have a beer, and admire your handiwork!! You deserve it!!

I hope you've had as much fun building this project as I did, and I sincerely hope that the insights, techniques, and skills picked up along the way will give you the confidence to design and scratchbuild other projects. One big advantage of scratchbuilding is that you're not limited to only those structures commercially produced, with all their inherent scale issues and "European Ancestry" look. Scratchbuilding allows you to produce anything for any era to fit in any space, so you have total freedom. While this structure is a rustic design made of wood, there's no reason why it couldn't just have easily been a large round water tank for a more modern railroad. Stations and industrial buildings can be produced - anything you can imagine can be scratchbuilt with a little imagination.

If you have any questions about this article, the water tank, or anything else, please feel free to email me (my email address is in my **Profile**) or post your question on the **myLargescale.com** forums and I'll do my best to answer them.

I'll wrap things up with some photos of the finished model.

Finished Photos

Here are some photos of the finished tank installed on the layout...

SCLCo No. 1 takes on water before heading out for her next run. Note the natural weathering of the **Sanding Facility** in the foreground. Look carefully and you can also see the "patch" on the end of the water spout made necessary by my own carelessness.

Steam locomotives are thirsty beasts, to be sure.

Again, note the difference in the finish between the newly installed **Water Tank** and the **Sanding Facility**, which has one winter outside under its belt. Also, note how much better the spout looks with the business end hogged out.

Detail Photos

These photos were taken immediately upon completion and prior to installation. They show some of the details more clearly, as well as the overall model.

Compare the business end of the spout here (prior to hogging out) with the photo on the previous pages. Quite a difference a little effort makes. The figure climbing the ladder is from "Just Plain Folk" - unfortunately, I didn't to save the part number.

A relative close-up of the right side...

and of the front...

and of the left side. I made a sign for mine with a spare 2 x 10 and dry transfers from Woodland Scenics.

A close-up of the Frost Box Door...

and a couple of views of the top to wrap things up.

That's all I have. I'll be looking forward to photos of your finished **Backwoods Water Tanks** on the forums, as well as some shots of your other creations. See you there.